UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Electrification Administration
Technical Standards Committees
(Electric)

Supplement No. 2, January 1984, to
REA Bulletin 43-5
LIST OF MATERIALS ACCEPTABLE FOR USE ON
SYSTEMS OF REA ELECTRIFICATION BORROWERS

The attached pages for the "List of Materials Acceptable for Use on Systems of REA Electrification Borrowers" are those which have been revised by action of the Technical Standards Committees during the months of October through December 1983. The following changes should be made in order to keep it up to date. Pages with a colon between are on the same sheet, both being changed.

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a-1	a-1	cy-2	cy-2
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a(1)	a(1)	dh	dh
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d	d	eb	eb
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n	n	fm	fm
p-8	p-8	ga-3	ga-3
p-9	p-9	gb-1	gb-1
p(1)	p(1)	sb-1	sb-1
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w	w	sl	sl
ae(Cond.)	ae(Cond.)	zz-2	zz-2
an-3.1	an-3.1	zz-3	zz-3
an(3.1)	an(3.1)	zz-7	zz-7
ap-1	ap-1	U ax (Cond.)	
bu	bu	U cg	U cg
cg-1	cg-1	U gc	U gc
cg-3	cg-3	U gp-1	U gp-1
cg-4	cg-4	U gp-2	
cp	cp	U hv-4	U hv-4
cu	cu	U hv(1)	U hv(1)
cy-1	cy-1	U ja(1)	U ja(1)
cy-1.1	cy-1.1	fn	fn

a - Insulator, pin type

Specifications

5 kV - used on 2.4 kV and 2.4/4.16 kV systems

ANSI Class 55-2	Plain	Radio-freed
Flashover, dry	50 kV	45 kV
Flashover, wet	25 kV	25 kV
Leakage distance	5 in.	5 in.
Pinhole diameter	1 in.	1 in.

Chance	C905-1302*
Brown Boveri Elec. (ITE)	8
**McGraw-Edison	NP8D8*
Ohio Brass	12847
Porcelain Products (Knox)	253

7.2/12.5 kV - used on 7.2/12.5 and 7.62/13.2 kV systems

ANSI Class 55-3	Plain	Radio-freed
Flashover, dry	65 kV	55 kV
Flashover, wet	35 kV	30 kV
Leakage distance	7 in.	7 in.
Pinhole diameter	1 in.	1 in.

Chance	C905-1303*
Brown Boveri Elec. (ITE)	5*
Joslyn (Pinco)	L63R*
McGraw-Edison	NP9D8*
Ohio Brass	38148*
Porcelain Products (Knox)	261-S*

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15 kV - used on 7.2/12.5 and 7.62/13.2 kV systems where greater insulation is needed

ANSI Class 55-4	Plain	Radio-freed
Flashover, dry	70 kV	65 kV
Flashover, wet	40 kV	35 kV
Leakage distance	9 in.	9 in.
Pinhole diameter	1 in.	1 in.

Chance	C905-1304*
Brown Boveri Elec. (ITE)	6*
Joslyn (Pinco)	L2064R*
McGraw-Edison	NP21D8*
Ohio Brass	38149*
Porcelain Products (Knox)	366-S*

*Radio-freed

**Available in white as indication of neutral. White insulators are non-radio-freed.

Radio-freed and non-radio-freed insulators made by these manufacturers and in these styles are acceptable.

NOTE: Post insulators (Item ea) may be substituted for the crossarm pin (Item f) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Form 803 at the option of the owner.

a - Insulator, pin type
(Radio-freed)

Specifications

Used on 14.4/24.9 kV
distribution lines.
Radio noise free, metal
thimble

Chance	C906-1311
Brown Boveri Elec. (ITE)	127-R
Joslyn (Pinco)	L1123-R
Ohio Brass	38246-7010
Porcelain Products (Knox)	2027-S

ANSI Class 56-1

Flashover, dry	95 kV
Flashover, wet	60 kV
Leakage distance	13 in.
Pinhole diameter	1-3/8 in.

Used on 33 - 34.5 kV
transmission lines.
Metal thimble

Chance	C906-1303
Brown Boveri Elec. (ITE)	245-R
Joslyn (Pinco)	L75-R
Ohio Brass	38223-7010
Porcelain Products (Knox)	2045-S

ANSI Class 56-3

Flashover, dry	125 kV
Flashover, wet	80 kV
Leakage distance	21 in.
Pinhole diameter	1-3/8 in.

Used on 44 - 46 kV
transmission lines.
Metal thimble.

Brown Boveri Elec. (ITE)	225-R
Ohio Brass	38255-7010

ANSI Class 56-4

Flashover, dry-wet	140-95 kV
Leakage distance	27 in.
Pinhole diameter	1-3/8 in.

NOTE: Post insulators (Item ea) may be substituted for the crossarm pin (Item f) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Form 803 at the option of the owner.

a - Insulators, pin type
(Radio-freed)

Manufacturer	Meeting No. and Date	Conditions
*Brown Boveri Electric 27R 24.9/14.4 kV ANSI Class 56-1	1235 5/27/82	To obtain experience.
*McGraw-Edison NP2T8 24.9/14.4 kV ANSI Class 56-1	1205 2/5/81	To obtain experience.

*Does not have metal thimble.

NOTE: Post insulators (Item ea) may be substituted for the crossarm pin (Item f) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Form 803 at the option of the owner.

b - Pin, pole top, steel

DISTRIBUTION

	7.2/12.5 or 7.62/13.2 kV	14.4/24.9 kV
Pin length, inches :	20	20
Thread diameter, inches:	1	1-3/8
Hole spacing, inches :	8	8
REA Specifications :	D-3	DT-3
Chance	2199	2195
Dixie	D-2172	D2195
Joslyn	J740	J720
Kortick		K8086
McGraw-Edison	DP19P6	DP19P5
Utilities Service	36606F-REA	36652

Pins listed below have 4-1/2" offset which eliminates the use of Item cs

Joslyn	J25179
McGraw-Edison	DP28P1
Utilities Service	36549

TRANSMISSION

	1-1/8" solid steel	Channel
Type :		
Pin length, inches :	24	24
Thread diameter, inches:	1-3/8	1-3/8
Hole spacing, inches :	8	8
REA Specifications :	None	DT-3
Chance		2196
Dixie	D2125	
Joslyn		J824
Kortick		K8087
McGraw-Edison		DP19P8
Utilities Service		36653F

NOTE 1. Pole top bracket (Item eb) and post insulator (Item ea) may be substituted for pole top pin (Item b) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Form 803 at the option of the owner.

2. Flared type pins may be mounted with either side against the pole.

c - Bolt, machine

Applicable Specification: ANSI C135.1, "Standards for Galvanized Steel Bolts and Nuts," except that the lengths are in the ranges given below.

Applicable Sizes : 1/2 inch diameter, 6 through 10 inch length

5/8 inch diameter, 6 through 24 inch length

3/4 inch diameter, 6 through 26 inch length

7/8 inch diameter, 6 through 28 inch length

The following manufacturers have shown compliance with the applicable specifications for machine bolts:

A. B. Chance Company
Dixie Electrical Manufacturing Company
Hughes Brothers
*Joslyn Manufacturing Company
Kortick Manufacturing Company
*McGraw-Edison
*Portland Bolt & Manufacturing Company
Steel City Bolt & Screw Co., Inc.
Utilities Service Company

*"Static proof" design available.

d - Washers
Flat Steel

Size, inches:	2¼ x 2¼	3 x 3	4 x 4	4 x 4	1-3/8 round	1-3/4 round
Thickness, in.:	3/16	¼	3/16	½	12 gauge	10 gauge
Hole Diam., in.:	13/16	13/16	13/16	13/16	9/16	11/16
Chance	6814	6817	6818	6819½	6803	6805
Dixie	D6814	D6817	D6818	D6819½	D6803	-
Hughes	SW2¼-70	SW3-70	SW4-70	SW4-70(½)	RW1-3/8-50	-
Joslyn	J1076	J22596	J1080	J1473	J1086	-
Kortick	K1553	K1555	L1557	K1559½	K1524	K1525
McGraw-Edison	DF2W5	DF2W7	DF2W10	DF2W15	DF1W2	DF1W3
Power Line Hardware	SWF225A	SWF33B	SWF44A	-	-	-
Utilities Service	5485	5487A	5488	5490A	5478	5479

Size, inches:	2¼ x 2¼	3 x 3	3 x 4	4 x 4	3 round
Thickness, in.:	¼	5/16	7/16	½	3/16
Hole Diam., in:	11/16	11/16	15/16	13/16	13/16 (spurred)
Barron Bethea (Nodular Iron)	GCW-1A* BB-214	GCW-31*	CRW-4A*	GCW-41*	-
Bethea Metals (aluminum alloy)	C-103*	C-105*	C-106*	C-108*	-
Bethea/National (Aluminum Alloy)	-	WC-33-5*	WC-34-7*	WC-44-6*	-
Continental (Nodular Iron)	-	CW-33-5*	CW-34-7*	CW-44-6*	TCSF-30-6
Flagg (MIF) (Malleable Iron)	P141* P56A	P143*	P120*	P144*	PX159A
Joslyn (Steel)	-	J114*	-	-	-
Lapp (Line Ware) (Malleable Iron)	304075* 304089	304078*	-	304082*	-
Power Line Hardware	-	CSW-33*	CRW-34*	CSW-44*	-

*Curved

1 - Deadend for Steel Strand (Overhead Ground Wire)

TRANSMISSION

For High Strength Steel Strand and Aluminum-Clad Steel Strand

Clamp Type

	High Strength Steel	Aluminum-Clad Steel		
Manufacturer	3/8" and 7/16"	7 No. 9 AWG	7 No. 8 AWG	7 No. 7 AWG
Anderson/Sq. D	SWDE-55N			
Bethea/National	FD-550-N (For use on 3/8" steel strand only)			
Ohio Brass	80437			

1 - Deadend for steel strand (overhead ground wire)

TRANSMISSION

For high strength, extra high strength steel strand and aluminum clad steel strand

Compression Type

Manufacturer	High Strength Steel 3/8"	7/16"	Aluminum-clad steel 7 No. 9 AWG	7 No. 8 AWG	7 No. 7 AWG	Extra High Strength 5/16"	3/8"	7/16"
Fargo	82S712	82S714	82A79	82A78	82A77	82S710	82S712	82S714
Alcoa	4620.12	4627.14						
Burndy	YTW375E	YTW438E	YTW7M9T	YTW7M8T	YTW7M7T			
Homac	Order by wire size and type.							

Formed Type

Chance				16M AWSBG	20M AWSBG			
Helical Line Prod.	HG210-3/8	HG211-7/16	HG523-12.5M	HG525-16M	HG528-20M	HG209-5/16	HG210-3/8	HG211-7/16

Automatic Type

Fargo	GDE-302	GDE-303	GDE-302	GDE-302	GDE-303	GDE-301	GDE-302	GDE-303
Reliable	5202	5203	5202	5202	5203	5201	5202	5203

n - Bolt, double arming

Applicable Specification: ANSI C135.1, "Standards for Galvanized Steel Bolts and Nuts."

Applicable Sizes : 5/8 inch diameter, 12 inch through 24 inch length

3/4 inch diameter, 20 inch through 24 inch length

The following manufacturers have shown compliance with the applicable specifications for double arming bolts:

A. B. Chance Company
Dixie Electrical Manufacturing Company
Hughes Brothers
*Joslyn Manufacturing and Supply Company
Kortick Manufacturing Company
*McGraw-Edison
Portlant Bolt & Manufacturing Company
Steel City Bolt & Screw Co., Inc.
Utilities Service Company

*"Static proof" designs available.

o

October 1983

o - Bolt, eye, oval

Applicable Specification: ANSI C135.4, "Standards for Galvanized Ferrous Eye Bolts and Nuts for Overhead Line Construction."

Applicable Sizes : 5/8 inch diameter, 6 inch through 20 inch length

3/4 inch diameter, 8 inch through 20 inch length

The following manufacturers have shown compliance with the applicable specifications for oval eye bolts:

Berny's Forging Company
A. B. Chance Company
Dixie Electrical Manufacturing Company
*Joslyn Manufacturing Company
Kortick Manufacturing Company
*McGraw-Edison
Utilities Service Company

*"Static proof" designs available.

Shoulder Eye Bolt
for Transmission Structures

3/4 inch diameter, 8 inch through 20 inch length

	Catalog Number
Joslyn	J9528 to J9540
Kortick	K9558 to K2570
McGraw-Edison	DF10E8 thru DF10E20

p - Connectors, Guy Bond (Parallel Groove)

Applicable Specification: "REA Specification for Connectors," DT-8

ACSR to Guy Strand

	2/0	1/0	2 & 4
Alcoa	396.6	396.6	490.0
Anderson/Sq. D	LC-52A-GP	LC-51C-GP	LC-51A-GP
Bethea/National	APG-3	APG-2	APG-2
Blackburn	PAE 2121-9	PAE 2121-9	PAE 2121-9
Burndy	UC28R	UCG25R	UCG25R
Dossert	AC103-LW	AC101-LW	AC100-LW
Fargo	GA-616	GA-620	GA-620
Joslyn	744AL	555AL	438AL
Penn-Union	ALC-15	ALC-10	PCA-010
Reliable	744AL	555AL	438AL
Weaver	NICR60	NICA60	NICA60

Copper to Guy Strand

Anderson/Sq. D	LC-511A
Blackburn	2HPW (¼") 1/0HPW (3/8") PAC7
Burndy	UC8W26L
C & R	CRJC-1
Dossert	UDV 13-1-P
Fargo	GC-8040P
ILSCO	SK-3 (¼") SK-1/0 (3/8")
Joslyn	J8300
Kearney	9968-1
Krueger & Hudepohl	UC58B-EV
Penn-Union	JC-1-AC (1/4", 3/8" guy strand) (1/0 strand copper max.)
Reliable	438ALC
Sherman	R-12
Weaver	K-1

p - Connectors, Compression

DISTRIBUTION

	Aluminum to aluminum	Aluminum to copper	Copper to copper	Tap connections (Al to Al, Al to Cu)
Anderson, Sq. D	AC Series	AC Series	VCUC	VCP
ITT Blackburn	Type WR	Type WR	Type CF	Type WR
Burndy	"Hycrimp"	"Hycrimp"	"Crimpit"	"Cabelok Crimpit"
Electrical Specialty	"Squeeze Conn" (Type S)	"Squeeze Conn" (Type S)	-	-
Homac	H Tap-OB&DB	H Tap-OB&DB	-	H Tap-OB&DB
Kearney	"Squeezon" (Aluminum)	"Squeezon" "Aluminum"	"Squeezon" (Copper)	"Squeezon" (Aluminum)
Penn-Union	"Press-On" (Aluminum)	"Press-On" (Aluminum)	"Press-On" (Copper)	"Penn-L-Tap"

p - Connectors, Compression

	SERVICE	
	Aluminum-to-Aluminum Aluminum-to-Copper	Copper-to-Copper
Alcoa	"SECS"	-
Anderson/Sq. D	Versa-Crimp (VCSE)	VCCS
ITT Blackburn	CS, KL	-
Burndy	"Linkits"	YDS-C, YDS-W
Electrical Specialty	VSE	-
Homac	"Shure Splicers"	-
Kearney	"Serv-ens"	-
National Tel. Supply	"Nicopress"	-
Penn-Union	"Penn Sleeves"	-

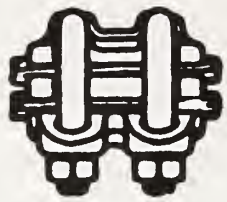
These connectors are furnished in a variety of sizes to fit all combinations of aluminum and copper service wire.

p - Connectors, Transmission

Bolted Type

Applicable Specification: "REA Specification for Connectors," DT-8

ACSR to ACSR
ACSR to Copper



Alcoa	580 Series
Blackburn	2U Series
Burndy (ACSR to ACSR)	UP-A, UP-R

When ordering these clamps specify size, stranding and material of both conductors.

Compression Type

ACSR to ACSR
Same Size

Conductor Size	Alcoa	Anderson	Burndy	Kearney	ITT Blackburn
1/0	5074.438	VCJS-50R	YCS25R	OHR-1/0-61AJ	RCJ10
2/0	5074.484	VCJS-50R	YCS26R	OHR-2/0-61AJ	RCJ20
3/0	5075.547	VCJS-61R	YCS27R	OHR-3/0-61AJ	RCJ30
4/0	5075.609	VCJS-61R	YCS28R	OHR-4/0-61AJ	RCJ40
266.8 kcmil	5076 Order by	VCJS-80R	YCS30R	HR-266-267AJ	RCJ266M
336.4 kcmil	5076 stranding	VCJS-80R	YCS33R	HR-336-267AJ	RCJ336M

ACSR to Copper

Alcoa	5070 Series
Anderson/Sq. D	VCJS
Burndy	YCR-R-CA

(Order by conductor sizes)

p - Connectors

(Wedge Type)

Manufacturer	Aluminum to aluminum	Aluminum to copper	Copper to copper	Tap connections (Al to Al, Al to Cu)
AMP	"Ampact" (Aluminum)	"Ampact" (Aluminum)	"Ampact" (Copper)	"Ampact" (Aluminum)
UTM	"Wrench-Lok"	"Wrench-Lok"	--	"Wrench-Lok"

p - Connectors

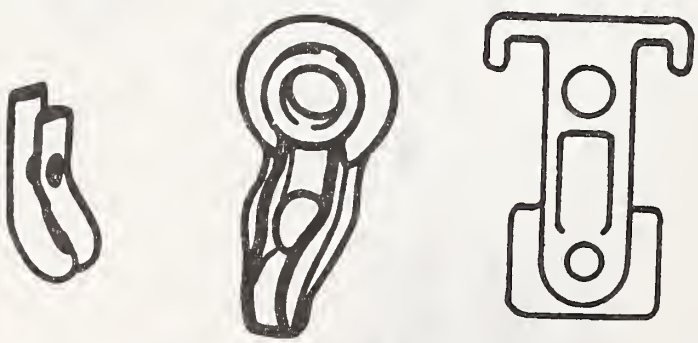
Manufacturer	Meeting No. and Date	Conditions
Anderson/Square D		
Compression, al to al, al to cu "Versa-Crimp" L tap.	748 11/1/62	To obtain experience.
Parallel groove, aluminum LC-52C (1/0 - 6/1 ACSR over armor rods) LC-51C (1/0 - 6/1 ACSR)	738 6/21/62	" " "
Burndy		
Compression, insulated "Insulink"	672 8/6/59	" " "
ITT Blackburn		
Compression, insulated service entrance connectors, Types ICS-1 and IKL	1027 10/11/73 1133 2/16/78	" " "
Homac		
Compression, insulated "Shure Splicers" Types QlN and UlN	1074 9/25/75 1269 11/17/83	" " "
Penn Union		
Compression, Insulated Type PIK	866 2/8/68	" " "
Utilco		
Two bolt style, al to al Type PM	1053 11/14/74	" " "

u - Deadend for alumoweld guy strand

Strand Size	3#10(4M)	7#12(6M)	7#11(8M)	7#10(10M)	7X.110"(11.5M)	7#9(12.5M)	7X121"(14M)	7#8(16M)	7X.148"(20M)
Formed Type Alumoweld Guy Strand									
Chance									
For standard guy		6M-AWSBG	8M-AWSBG	10M-AWSBG		12.5M-AWSBG			
Helical Line Prod.									
For standard guy		HG517-6M	HG519-8M	HG521-10M		HG523-12.5M			
Preformed Line Prod.									
For standard guy	AWDE-4108	AWDE-4110	AWDE-4113	AWDE-4116	AWDE-4118	AWDE-4119	AWDE-4120	AWDE-4122	AWDE-4126
For wrapped guy		WGL-4110	WGL-4113	WGL-4116		WGL-4120			
Automatic Alumoweld Guy Strand									
Fargo		GDE-300	GDE-301	GDE-301		GDE-302			
Reliable		5200	5201	5201		5202			

v - Guy attachment
for 5/8" bolt

Type:	Formed Strap	Angle Bolt Eye	Guy Hook	Pole Eye Plate
Maximum Working Load Rating	23,130 N (5200 lbs.)	23,130 N (5200 lbs.)	23,130 N (5200 lbs.)	37,800 N (8500 lbs.)
Anderson Elec./ Square D	-	-	-	GSP-05
Barron Bethea	-	-	GH-5*-	-
Bethea Metals			C101A	
Bethea/National	-	-	AG-5*	PE5-6A
Champ	-	-	CH58GH*	CH21PE
Chance	5004	0100	C203-0168*	-
Continental Electric	-	-	GAD-56-4	PEP-66-45
Dixie	D5004	D0100	DD-9460,DD9462*	-
Flagg (MIF)	-	-	P151A,P151X*	PX88
Joslyn	J25164	J6500	J6555,J6556	-
Kortick	K4035,K4047	K3140	-	-
Lapp (Line Ware)	-	-	304014*	304021
McGraw-Edison	DG6H1	DG11E1	DG21H1 DG21H2	-
Power Line Hardware	-	-	HGA-58C*	PGA-548
Util. Service	31030	5531	-	-



*This hook may also be used in place of the wrapped guy arrangement in assemblies E3-2 and E3-3.

v - Guy attachment

Manufacturer	Meeting No. and Date	Conditions
Joslyn Pole band, with cone head bolt J-6281 and guy clip J-6275 J-6280(for 6" to 10" pole) J-6270(for 8" to 14" pole)	745 8/16/62	To obtain experience. For distribution line only and 10,000 lbs. maximum loading.

w - Insulators, guy strain
(Fiber Reinforced Plastic)

Ult. Strength, pounds	11,000	15,000	21,000
Barron Bethea	BB-11-CC Series	BB-15-CC Series	BB-21-CC Series
Continental	G-11 Series	G-15 Series	G-21 Series
Flagg (MIF)	150 Series	150 Series	210 Series
Joslyn-Empire	400 Series	500 Series	650 Series
Kearney	-	321015	321021
Plastigage	HSI1-1P Series	HSI-2X Series	HSI3-1P Series
Shakespeare	-	692 Series	694 Series

ae - Surge Arresters, Substation*
(Lightning Arresters)

Manufacturer	Type	Accepted Ratings - kV	Manufacturer's Classification
General Electric	Alugard	3, 9, 10, 18	Distribution
Joslyn	2RS	9/10, 18	Distribution
	Q	3, 9/10, 18	Distribution
Kearney	Unigap	3, 9, 10, 18	Distribution
McGraw-Edison	ES	3, 9/10, 18	Distribution
	F3	9-120	Intermediate
	G	3-144	Station
Ohio Brass	GP	3-72	Intermediate
	MPA	3-15	Station
	MP	3-48	Station
	MPR	60-312	Station
	DA	3, 9, 10, 18	Distribution
Westinghouse	LV	3-20	Distribution
	IVL	3-120	Intermediate
	CPL	3-312	Station

*For instructions concerning application at substations refer to REA Bulletin 65-1, "Guide for the Design of Substations for Electric Borrowers." In the purchase of arresters, care should be taken to select the type and voltage rating in accordance with the line voltage and the type of construction (grounded or ungrounded).

Conditional List
ae
January 1984

ae - Surge Arrester, Substation*

Manufacturer	Meeting No. and Date	Conditions
General Electric		
Surge arrester, station class, metal oxide type, Tranquell, 2.7 kV thru 588 kV	1164 5/24/79	To obtain experience
Surge arrester, intermediate class, metal oxide type, Tranquell, 3 kV thru 120 kV	1197 10/9/80	To obtain experience
Joslyn		
Surge arrester, intermediate class, metal oxide type, Type ZI 3-144 kV	1268 10/27/83	To obtain experience
McGraw-Edison		
Surge arrester, station class, metal oxide type, VariSTAR 3 kV thru 192 kV Type ATZ1A	1223 11/19/81	To obtain experience
Ohio Brass		
Surge arrester, station class, metal oxide type, Dynavar, 3 kV thru 357 kV	1175 11/2/79 1239 7/29/82	To obtain experience
Surge arrester, intermediate class, metal oxide type, Dynavar, 3 kV thru 120 kV	1242 9/9/82	To obtain experience
Westinghouse		
Surge arrester, station class, metal oxide type, SMX-30, 3 to 240 kV	1256 4/6/83	To obtain experience

*For instructions concerning application at substation refer to REA Bulletin 65-1, "Guide for the Design of Substations for Electric Borrowers." In the purchase of arresters, care should be taken to select the type and voltage rating in accordance with the line voltage and the type of construction (grounded or ungrounded).

an - Transformers, Power
Single-Phase, Step-Down
for Distribution Substation Use

Primary Voltage-kV	kVA Capacity												
	167	250	333	500	833	1250	1667	2500	3333	5000	6667	8333	10,000
Kuhlman													
34.4			X	X	X	X	X	X					
43.8			X	X	X	X	X	X	X				
67.0				X	X	X	X	X	X				
115									X				
McGraw-Edison													
34.4	X	X	X	X	X	X	X						
43.8				X	X	X	X						
67.0			X	X	X	X	X						
RTE-ASEA													
34.4					X	X							
43.8							X						
Westinghouse													
34.4					X	X	X	X	X				
43.8					X	X	X	X	X				
67.0					X	X	X	X	X				
115											X		

an - Transformers, Power
Three-Phase, Step-Down
for Distribution Substation Use

Primary Voltage-kV	kVA						MVA							
	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
Central Moloney														
34.4	X	X	X	X	X	X	X	X						
43.8	X	X	X	X	X	X	X	X	X					
67.0	X	X	X	X	X	X	X	X	X					
Federal Pacific														
67.0							X			X	X	X	X	
115										X	X		X	X
138										X	X	X	X	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Federal Pacific Type TC-525 load tap changers.

General Electric														
34.4	X	X		X	X	X	X	X	X	X	X	X		
43.8	X	X		X	X	X	X	X	X	X	X			
67.0	X	X		X	X	X	X	X	X	X	X	X	X	X
115							X	X	X	X	X		X	
138							X		X	X	X	X	X	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using General Electric Types LR72, LR65 and LRT-200 load tap changers.

Kuhlman														
34.4					X	X	X	X	X	X	X		X	
43.8					X	X	X	X	X		X	X		
67.0					X	X	X	X	X	X	X	X		
115							X	X	X	X	X	X	X	
138							X	X	X	X	X	X		X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Siemens-Allis Types TLS and TLH-21 load tap changers.

an - Transformers, Power
Three-Phase, Step-Down
for Distribution Substation Use

Condition of Acceptance: To obtain experience.

Primary Voltage-kV	kVA						MVA							
	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
Central Moloney														
34.4									s					
Federal Pacific														
34.4							s	s	s					
67.0								s	s					
Ferranti-Packard														
34.4	s		s		s	X	s	s						
General Electric														
34.4													s	s
43.8												s	s	s
115												s		s
138								s						

Transformers 5 MVA and larger also accepted as load tap changing transformers using Federal Pacific Type TC-525 load tap changers.

Transformers 5 MVA and larger also accepted as load tap changing transformers using General Electric Types LR72, LR65 and LRT-200 load tap changers.

an - Transformers, Power
Three-Phase, Step-Down
for Distribution Substation Use

Condition of Acceptance: To obtain experience.

Primary Voltage-kV	kVA						MVA							
	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
Hevi-Duty														
34.4	s	s	X	s	X	X	X	X	s	s	X	s	s	s
43.8	s	s	s	s	s	X	X	X	X	X	X	s	s	s
67.0			X		X	X	X	X	X	X	X	X	s	s
115						X	X	X	X	X	X	X	s	s
138							s	s	X	s	s	s	X	s

Transformers 5 MVA and larger also accepted as load tap changing transformers using Westinghhouse Types UTS-A and UTT-B and Siemens-Allis Type TLS load tap changers.

McGraw-Edison														
34.4	s		s								s	s	s	s
43.8	s		s								s	s	s	s
67.0	s		s								s	s	s	s

Transformers 5 MVA and larger also accepted as load tap changing transformers using McGraw-Edison Types 550, 550B and 550C load tap changers.

H. K. Porter (Delta-Star)														
34.4	s	s	s		s	X	X	X	s					
43.8			s	s	s	X	X	X	s	X				
67.0		s	X	s	X	X	X	X	X	X	X			
115							X	X	s	X	X			
138							s	s	s	s	s	s	s	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Siemens-Allis Types TLS and TLH-21 load tap changers.

ap - Clamp, hot line
Copper and Copperweld-copper Conductor

Conductor Size			
Copper	2/0	1/0	2 thru 6
Copperweld-copper	___	2A	4A thru 8A
Blackburn	PGH3	PGH3	PGH3
Fargo	GH-209	GH-209	GH-209
Weaver	IWS	IWS	IWS

Clamps listed below have springs and enclosed thread chambers. They are recommended for use in areas where severe corrosion or vibration trouble is experienced.

Anderson	BH-00	BH-00	BH-00
Chance	S1520CC	S1520CC	S1520CC
Electrical Specialty	BHC	BHC	BHC
Fargo	GH-100*	GH-100*	GH-100*
Ideal	3532	3532	3532
Penn-Union	HLC-020-LS	HLC-020-LS	HLC-020-LS

*For use with CL Fuse, order GH-201

ap - Clamp, hot line
ACSR with armor rods

Clamps listed below have spring action and enclosed thread chambers.

Conductor Size		4/0 & 3/0	2/0	1/0 & 2	4
	Tap Conductor				
Anderson	Aluminum	AH-7	AH-4	AH-4	AH-4
	Copper	AH-7-GP	AH-4-GP	AH-4-GP	AH-4-GP
Chance	Aluminum	S1540-AA	S1540-AA	S1530-AA	S1530-AA
	Copper	S1540-AC	S1540-AC	S1530-AC	S1530-AC
Electrical Specialty	Aluminum	-	AHC-2/0	AHC-2/0	AHC-2/0
	Copper	-	AHC-2/0 GP	AHC-2/0 GP	AHC-2/0 GP
Fargo	Aluminum	GH-102A	GH-102A	GH-101A	GH-101A
	Copper	GH-102AC	GH-102AC	GH-101AC	GH-101AC
Penn Union	Aluminum	-	-	HLCA-040	HLCA-040
	Copper			HLCA-040	HLCA-040
Utilco	Aluminum	-	HLC-397	-	HLC-40
Weaver	Aluminum	W-1066AA	W-1066AA	W-6336AA	W-6336AA

bu - Connector, grounding
for transformer or other equipment

Manufacturer	Copper Alloy [1]	Plated Copper Alloy [2]	Aluminum Alloy [3]
Anderson/Square D	GTCL-23A	GTCL-23A-TP	
ITT Blackburn	TTC-4	TTC2P	
Burndy	EQC632C	EQC632C-TN	
Dossert	TGCL8-50	TGCL8-50-SN	
Fargo	GC-207	GC-207P	GA-220
Penn-Union		GSE-C1TN	
Power Line Hardware	TGL-110	TGL-110P	
Tanner		GET-1-TN	
ITT Weaver	TGC-4	TGC-2P	

1 - For use with copper type ground wire.

2 - For use with both copper and aluminum type ground wire.

3 - For use with aluminum type ground wire.

bv, Rods, armor

Aluminum or aluminum alloy rods for use on ACSR

Blackburn	Formed Type
Dulmison	Formed Type
Helical Line Products	Formed Type
Preformed Line Products	Formed Type
Southwire	Straight

Copperweld rods for copper or CWC conductor

Helical Line Products	Formed Type
Preformed Line Products	Formed Type

Alumoweld rods for aluminum clad steel (Alumoweld) overhead ground wire

Helical Line Products	Formed Type
Preformed Line Products	Formed Type

Bronze rods (10 inch length) for jumper protection

Preformed Line Products	Formed Type

cg - Switch, air, three-pole, group-operated
NEMA standard switches for station and line structures

Manufacturer	Acceptable Mounting on Structures	Tilting Ins. Type	kV	Vertical Break Type	kV	Side Break Type	kV	Center Break Type	kV	Double Break Type	kV
Brown Boveri Elec. (ITE)	Horizontal			TTR6	15-345						
A. B. Chance	Horizontal					D6(L)	15-34.5				
	Phase over Phase					D6(L)	15-34.5				
	Vertical					D6(L)	15-34.5				
Johnson	Horizontal			VIP	15-230	LS	15-69	M	15-230		
Joslyn	Horizontal			RF-2(VL)	15-230	RB-1(VL)	15-25				
(Hi-Voltage)	Horizontal					RB-1*	15-115				
Kearney	Horizontal	NE-2	15-34.5	AR 60-P	15-69						
MEMCO	Horizontal	AgF	15-69	EA	15-345			EE	69-230		
	Horizontal	AgC	15-69								
G & W Electric Company	Horizontal			MK-40	15-69	PMB-40A	15-69	LPC	69-230		
Powerdyne	Horizontal							V2-V4	15-230		
(Kearney)	Phase over Phase							V2	15-23		
ITT Royal	Phase over Phase					RG-63(L)	15-69				
Switchgear	Horizontal					RSL-L(L)	15-69				

(L) Means gas or solid material full-load interrupters are accepted and available.
(VL) Means vacuum full-load interrupters are accepted and available.
* These switches may be purchased with reduced voltage vacuum interrupters and may be applied for loop sectionalizing duty when peak recovery voltage does not exceed 25 kV.
NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, air, three-pole, group-operated
NEMA standard switches for station and line structures

Manufacturer	Acceptable Mounting on Structures	Tilting Ins. Type kV	Vertical Break Type kV	Side Break Type kV	Center Break Type kV	Double Break Type kV
S & C	Horizontal		Alduti(L)15-34.5	Alduti(L)15-25		Alduti(L)34.5-46
	Phase over Phase		Alduti(L)15-25	Alduti(L)15-25		Alduti(L)34.5-46
	Vertical		Alduti(L)*15-34.5	Alduti(L)15-25		Alduti(L)*34.5-46
SEECO	Phase over Phase			GOABS(VL)15-69		
	Horizontal		Hl 15-230	S 15-69		
Siemens-Allis	Horizontal		TA(VL) 15-69	SSB-T 15-69	CCB-115-230 CNL-2 115-230	
Southern States	Horizontal		EV 15-230	57K 15-69		
Turner	Phase over Phase			(1D,2D,3D)(VL) 15-161		
	Horizontal			1D(VL) 15-161		
USCO	Horizontal		AGT(VL)**15-230	GSH-4(VL)15-138	AGCH** 15-345	
	Horizontal				AGCH-V**34.5-230	
	Phase over Phase			GSH-4(VL)15-138	GCH 15-23	

(L) Means gas or solid material full-load interrupters are accepted and available.
(VL) Means vacuum full-load interrupters are accepted and available.
* These switches, except 34.5 kV Alduti vertical break, are available and accepted in combination with the S & C Type SMD substation fuse cutouts listed on page af-3.
** Also available in bronze in some ratings.

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, air, three-pole, group-operated

(Not Suitable for Substation Use)

Manufacturer	Acceptable Mounting	Vertical Break Type	kV	Side Break Type	kV	Center Break Type	kV
Chance	Horizontal			D6(L)15-34.5			
	Phase over Phase			D6(L)15-34.5			
	Vertical			D6(L)15-34.5			
K-P-F	Horizontal	SV-202	23	A202-A208	15-110		
	Phase over Phase			A202	15-23		
	Phase over Phase			W202	15-23		
	Phase over Phase			MD202	15-23		
Powerdyne (Kearney)	Horizontal			S	15-23	V2	15-23
	Phase over Phase			S	15-23	V2	15-23

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, air, three-pole, group-operated (Factory Preassembled)

Manufacturer	Acceptable Mounting on Structures	Vertical Break Type kV	Side Break Type kV
Chance	Horizontal (A)		D7(L)15-27
	Phase over phase (A)		D7(L)15-27
	Vertical (A)		D7(L)15-27
	Horizontal (B)		D7(L)34.5 (200 kV BIL)#
	Phase over phase (B)		D7(L)34.5 (200 kV BIL)#
	Vertical (B)		D7(L)34.5 (200 kV BIL)#
S & C	Horizontal (A)		Alduti(L)15-25
	Phase over phase (A)		Alduti(L)25
	Vertical (A)		Alduti(L)15-25
	Phase over phase (B)	Alduti(L)34.5 (200 kV BIL)#	Alduti(L)34.5 (200 kV BIL)#
	Vertical (B)	Alduti(L)34.5 (200 kV BIL)#	

(L) Means gas or solid material full-load interrupters are accepted and available.

Accepted for transmission use only, provided the steel crossarm base is grounded with an adequate grounding connector.

(A) Not suitable for substation use.

(B) NEMA standard switches for station and line structures.

NOTE: Switches with factory-assembled crossarm type bases must have nonconducting crossarm type bases, nonconducting braces, and insulated interphase and control rods, except as otherwise noted.

cp - Deadend, Compression Type

ACSR

Conductor Size	Alcoa	Anderson/Sq. D
1/0	Order by	VCD-50R
2/0	Conductor	thru
3/0	Size and	VCD-61R
4/0	Stranding	"
266.8 kcmil 26/7	2-piece	VCD-831-1-RM
336.4 kcmil 26/7	alloy	VCD-831-1-RM
477 kcmil 26/7	compression	VCD-832-2-RM
556.5 kcmil 26/7	Type VES or	VCD-833-3-RM
795 kcmil 26/7	HES	VCD-835-4RM
954 kcmil 54/7	"	VCD-835-4RM

Conductor Size	Burndy	Fargo	Kearney	Homac
1/0	Type Y-W		104000	Order by
2/0	"		thru	Conductor
3/0	"		104000-03	Size and
4/0	"		"	Stranding
266.8 kcmil 26/7	"	Uni-Grip	104000-05	"
336.4 kcmil 26/7	Type YTW	one die	thru	"
477 kcmil 26/7	"	system	104000-14	"
556.5 kcmil 26/7	"	Order by	"	"
795 kcmil 26/7	"	conductor size		
954 kcmil 54/7	"	and stranding		

ACSR
Adjustable

Fargo
Homac — Order by conductor size and stranding.

Aluminum Alloy (6201 and 5005)

Conductor Size: 4 thru 4/0

Anderson/Sq. D — Type VOD, Order by conductor size.

Copper

Conductor Size:	2 x 3	4	6
National Tel. Supply	71-258/3X	71-204-P	71-162-J

Copperweld-Copper

Conductor Size:	6A	8A
National Tel. Supply	71-6A-P	71-8A-P

cp - Deadend, compression type

Manufacturer	Meeting No. and Date	Conditions
Burndy		
AWAC 4-4/3 YTW7M10T	1050 9/19/74	To obtain experience.
AWAC 2-4/3 YTW7M9T		
AWAC 1/0-4/3 YTW7M7T		

cu - Brace, crossarm, wood

Span, inches	60	60
Drop, inches	18	30
Aluma-Form	6018	6030
American Crossarm & Conduit Company	320	325
Brooks Lumber Company	44680	44681
Cascadian Company	15018	15030
Dis-Tran	DT-60	DT-601
Hatheway Patterson	16018	-
Hughes	2045-CC	2045-D
Joslyn	J4760R	J4730W-R
Utilities Structures Engineering Incorporated	CU-60-18	CU-60-30

Braces listed below have 26-inch hole spacing. They are interchangeable with the flat steel braces listed on page h.

Aluma-Form	AF626
American Crossarm & Conduit	600
Brooks Lumber Company	58128
Dis-Tran	DT-28
Hatheway Patterson	7026
Hughes	2023
Joslyn	J5526

Brace, crossarm, fiber reinforced plastic

Continental	CRB-28
Joslyn	RP-26
Plastigage	CAB-28
Shakespeare	533

cx - Splice, oval tube

Conductor Size:	ACSR 4	2	1/0	2/0

Conductor Size:	Copper 0 x 7	2 x 3	4	6
MEMCO	63	62	58	56
National Tel. Supply	464	463	459	457

Conductor Size:	Copperweld-Copper 6A	8A
MEMCO	170	168
National Tel. Supply	460	459

cy - Splice, Compression

ACSR

Conductor Size	Alcoa	Anderson/ Sq. D	Burndy
4 6/1	2-piece	VC-36R	"Unisplice"
4 7/1	Order	VC-36R	(1-piece)
2 6/1	by	VC-36R	or Y-S
2 7/1	Conductor	VC-36R	(2-piece)
1/0	Size	VC-50R	Order by
2/0	and	VC-50R	Conductor
3/0	Stranding	VC-61R	Size and
4/0	"	VC-61R	Stranding
266.8 kcmil 26/7	2-piece	VC-831-1-RM	2-pc.
336.4 kcmil 26/7	Compression	VC-831-1-RM	Type YTS
477 kcmil 26/7	Alloy Type	VC-832-2-RM	"
556.5 kcmil 26/7	CJ	VC-833-3-RM	"
795 kcmil 26/7		VC-835-4RM	"
954 kcmil 54/7		VC-835-4RM	"

Conductor Size	Fargo	ITT Blackburn	Kearney 2 pc.	Kearney 1 pc.
4 6/1		Type RC		OH4-61-71AS
4 7/1		1-piece		OH4-61-71AS
2 6/1		Order		OH2-61-71AS
2 7/1		by		OH2-61-71AS
1/0		Conductor	OH1/0-61A	OH1/0-61AS
2/0		Size	OHR2/0-61A	
3/0		and	OHR3/0-61A	
4/0		Stranding	HR4/0-61A	
266.8 kcmil 26/7	Uni-Grip	#4 to 4/0	HR-266-267A	
336.4 kcmil 26/7	one die		HR-336-267A	
477 kcmil 26/7	system		HR-477-267A	
556.5 kcmil 26/7	Order by		HR-556-267A	
795 kcmil 26/7	conductor size			
954 kcmil 54/7	and stranding			

Conductor Size	Nat. Tel. Supply	Homac	ESP
4 6/1	"Nicopress"	"Tension	FTR-4
4 7/1	(1-pc. or 2-pc.)	splicer"	FTR-4
2 6/1	Order by Conduc-	(1-piece or	FTR-2
2 7/1	tor Size and	2-piece	FTR-2.5
1/0	Stranding	Order by	FTR-1/0
2/0	2-pc.	Conductor	FTR-2/0.5
3/0	"	Size and	FTR-3/0
4/0	"	Stranding	FTR-4/0
266.8 kcmil 26/7	"	2-pc.	
336.4 kcmil 26/7	"	"	
477 kcmil 26/7	"	"	
556.5 kcmil 26/7	"	"	
795 kcmil 26/7			
954 kcmil 54/7			

cy - Splice, Compression

Copper and Copperweld-Copper

Conductor Size	Anderson/ Sq. D	Burndy	Kearney	Nat. Tel. Supply
6 cu	VCC-28	YDS6W	OH6C	1-162/J
4 cu	VCC-28	YDS4W	OH4C	1-204/P
2 x 3 cu	-	YDS2C-3	OH2-3CX	1-258/3X
0 x 7 cu	-	YDS25	OH1-7C	1-325/7F6
8A CWC	VCC-28	YDS8KT	OHR8ACW	1-8A-P
6A CWC	VCC-28	YDS6KT	OHR6ACW	1-6A-P
4A CWC	VCC-37	YDS4KT	OHR4ACW	1-4A-X
2A CWC	VCC-43	-	-	-

Conductor Size	Homac
6 cu	J2C3
4 cu	L2C5
2 x 3 cu	S2C7
0 x 7 cu	U2C9
8A CWC	L2E1
6A CWC	L2E3
4A CWC	Q2E5
2A CWC	U2E7

cy - Splice, compression (one-piece)

(For 6201 and 5005 Aluminum Alloy Conductors)

Conductor Size	Anderson/ Square D	Burndy	ITT Blackburn
#4 thru 4/0	Type VC-R Order by Conductor Size and Stranding	"Unisplice" Order by Conductor Size and Stranding	Type RC Order by Conductor Size and Stranding

Conductor Size	Homac	ESP
#4 thru 4/0	"Tension Splicer" Order by Conductor Size and Stranding	Type FTR order by size and stranding

cy - Splice, compression

1-piece splice for ACSR

Manufacturer	Meeting No. and Date	Conditions
*ALCOA "Jiffy Joint"	704 11/10/60	To obtain experience.

1-piece splice for AWAC

Manufacturer	Meeting No. and Date	Conditions
Burndy AWAC 4-4/3 YDS7M10T AWAC 2-4/3 YDS7M9T AWAC 1/0-4/3 YDS7M7T	1050 9/19/74	To obtain experience.

*Satisfactory for use with 6201 and 5005 all aluminum alloy conductor through 4/0 and 19 strand conductors of sizes 26,800 CM and 477,000 CM.

cz - Splice for Steel Strand (Overhead Ground Wire)

Compressions

Single Sleeve Only

	High Strength Steel		Extra High Strength			Aluminum Clad Steel		
	3/8"	7/16"	3/8"	5/16"	7/16"	7 No. 9 AWG	7 No. 8 AWG	7 No. 7 AWG
Aloca			4914.386		4916.453			
Burndy	YTS375E	YTS438E				YDS7M9T	YDS7M8T	YDS7M7T
Fargo	81390	81468	81390	81344	81468	81375	81421	81468
Homac	29714							
Kearney	HR-3/8-3-7S							
National Tel. Supply	5-7/120G92	5-7/145J22						

Steel and Aluminum Sleeves

Homac	29714 & 28414 (Two piece)	

Automatic

Reliable	5043	5003	5042	5041	5043	5042	5042	5043

Bolted Type

Electroline	GD-537	

Formed Type

Helical Line Products	HS-310-3/8"	HS-311-7/16"

da - Bracket, insulated

	Bracket without Insulator	Bracket with 1-3/4" Spool Insulator	Bracket with 3" Spool Insulator
Chance	0327	0327-C909-1032	0327-C909-1034
Dixie	D0327	-	-
Joslyn	J1300	J1301	J1303
Kortick	K9278	K9081	K9082
McGraw-Edison	DC2C1	-	-
Hughes	1077LI	1077SI	1077I

dd - Adapter, Insulator

(For adapting machine bolt to pin insulator thread)

Bolt Size, Inches	5/8	5/8
Insulator Thread Dia., Inches	1	1-3/8
Manufacturer		
Chance	4258	-
Joslyn	J2840	J2841
McGraw-Edison	DP1A1	DP1A2

dh - Ground, pole

(For system grounds see ground rods on page ai.)

Manufacturer	Catalog Number
Galvanized Steel Plate With Insulated Copper Lead	
(For connecting to a copper or aluminum ground wire above ground.)	
Blackburn	GP-2
Joslyn	J055W
Power Line Hardware	PGPS-56CL8
Weaver	GSP-1
Galvanized Steel Plate With Connector	
(For connecting to a galvanized iron ground wire.)	
Blackburn	GP-2C
Joslyn	J055
McGraw-Edison	DN13M1
Power Line Hardware	PGPS-56C
Weaver	GSP-2
Copper Plate	
Blackburn	GP-100
Homac	5575
Joslyn	J-9196
Power Line Hardware	PGPC-56
Weaver	PBH

dt - Deadend, service

For deadending triplex type service cable, Drawing K10C.

Manufacturer	ACSR Size	Catalog No. Wedge Type	Catalog No. Formed Type
Blackburn	4	W6-4AA	-
	2	W6-2AA	-
	1/0	W2-0AA	-
Burndy	4	CW2R-1	-
Chance	4	-	CSG-030
	2	-	CSG-050
	1/0	-	CSG-070
Helical Line Products	4	-	HSG-514
	2	-	HSG-518
	1/0	-	HSG-522
Joslyn	4 & 2	R7295	-
	1/0	R7287	-
Penn-Union	4 & 2	WDC-2S	-
	1/0	WDC-10S	-
Preformed Line Products	4	-	SG-4502
	2	-	SG-4504
	1/0	-	SG-4506
Reliable	4 & 2	7295	-
	1/0	7287	-

du - Link, Extension

DISTRIBUTION

Manufacturer	Catalog Number
Bethea/National	LCE-14
Chance	C207-0112
Continental	CEL-14
Flagg (MIF)	PA319
McGraw-Edison	DC33B6
Utilities Service	495

Guy Extension Link
(For "H" Structure)

Manufacturer	One Guy Attachment	Two Guy Attachment
Joslyn	J22421	J22523

NOTE: The distribution extension links may be substituted for anchor shackle (Item bo), eye bolt (Item o) and eye nut (Item aa) for both small and large conductor drawings shown in REA Form 803 and REA Bulletin 50-3 at the option of the owner.

dz - Clip, Guy Wire

Manufacturer	5/16"	3/8"	7/16"	1/2"
Chance	6453	6454	6455	6456
McGraw-Edison	DJ17C6	DJ17C8	DJ17C10	DJ17C12
Utilities Service	4953	4954	4955	4956

ea - Insulator and Stud, post type

DISTRIBUTION

System voltage, kV	7.2/12.5*	7.2/12.5*	14.4/24.9
Leakage, inches	7-1/2	10	15
Flashover, dry, kV	65	70	95
Flashover, wet, kV	40	50	65
Chance (Aluminum base, also available with malleable iron base)			
7" Stud	C903-1900-04	C903-1901-04	C903-1902-04
1-3/4" Stud	C903-1900-05	C903-1901-05	C903-1902-05
Lapp			
7" Stud	4415P	4420P	4427P
1-3/4" Stud	4315P	4320P	4327P
Ohio Brass			
7" Stud		43400-7040	43401-7040
1-3/4" Stud		43400-7010	43401-7010

TRANSMISSION

System voltage, kV	22	34.5	46
EEI-NEMA Class	57-2	57-3	57-4
Flashover, dry, kV	110	125	150
Flashover, wet, kV	85	100	125
Chance			
7" Stud	C903-1002-04	C903-1003-04	
1-3/4" Stud	C903-1002-05	C903-1003-05	
Lapp			
7" Stud	9435P	9445P	9455P
1-3/4" Stud	9335P	9345P	9355P
Ohio Brass			
7" Stud	37620-7040	41640-7040	41650-7040
1-3/4" Stud	37620-7010	41640-7010	41650-7010

NOTE: Post Insulators (Item ea) may be substituted for the crossarm pin (Item f) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Form 803 at the option of the owner.

*The transverse loading on these insulators shall not exceed the lower of 40 percent of the insulator's ultimate strength and the maximum transverse loading given for the structure in REA Bulletin 50-3.

eb - Bracket, Pole Top
For Post Type Insulators

DISTRIBUTION

Barron Bethea (7.2 or 14.4 kV)	1B-4
Bethea/National (7.2 or 14.4 kV)	BPT-58F
Continental (7.2 or 14.4 kV)	PTB-55-8
Flagg (MIF) (7.2 or 14.4 kV)	P526
Joslyn (7.2 or 14.4 kV)	J23333
Lapp (Line Ware) (7.2 or 14.4 kV)	304043
McGraw-Edison (7.2 or 14.4 kV)	DC62B1
Ohio Brass (7.2 or 14.4 kV)	84324
(7.2 kV)	89725
Universal Electric (7.2 or 14.4 kV)	PT-8R

TRANSMISSION

Barron Bethea	1B-4
Bethea/National	BPT-58HF
Continental	PTB-66H
Flagg (MIF)	P532
Lapp (Line Ware)	304044
McGraw-Edison	DP29A1
Ohio Brass	84324

NOTE: Pole top bracket (Item eb) and post insulator (Item ea) may be substituted for pole top pin (Item b) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Form 803 at the option of the owner.

ec
July 1983

ec - Bracket, Offset Neutral

Chance	C206-0004
Dixie	D-2352
Joslyn	J2352
McGraw-Edison	DC6N1

eq - Narrow Profile Brackets and Special Arm Assemblies
(See REA Bulletin 61-12)

METAL BRACKETS

Manufacturer	Meeting No. and Date	Conditions
Flagg (MIF)		
Single post insulator bracket, P542	1032 12/20/73	1. To obtain experience.
Deadend bracket assembly, PAX188A		2. For use only in scenic areas and locations where right-of-way is limited.
Deadend bracket assembly, PAX188M for 14.4/24.9 kV construction	1044 6/27/74	
Standoff bracket, PA619H	1048 8/22/74	3. Not to be used where conductor galloping may be expected.
Joslyn		
Single post insulator brackets 24840.1, for 7.2/12.5 kV construction only 24840.2, for 14.4/24.9 kV construction	1043 6/13/74	(Same as above)
Chance		
Single post insulator brackets C206-0209 for 7.2/12.5 kV construction only C206-0010 for 14.4/24.9 kV construction	1049 9/5/74	(Same as above)
Deadend bracket assembly, C206-0179	1081 1/8/76	
Deadend bracket assembly, C206-0211 for 14.4/24.9 kV construction		
Royston		
Two post insulator bracket RMC-001 for 7.2/12.5 or 14.4/24.9 kV construction	1053 11/14/74	(Same as above)
Continental		
Standoff bracket IACB-18-5 LGE	1065 5/15/75	(Same as above)

eq - Narrow Profile Brackets and Special Arm Assemblies
(See REA Bulletin 61-12)

METAL BRACKETS

Manufacturer	Meeting No. and Date	Conditions
Lapp Single post insulator bracket, 304031-G	1104 12/16/76	1. To obtain experience. 2. For use only in scenic areas and locations where right-of-way is limited. 3. Not to be used where conductor galloping may be expected.
Western Power Products Single post insulator bracket, HDB-200-R, for 7.2/12.5 kV construction only	1152 12/7/78	Same as above.
Bethea/National Single post insulator bracket, HBF-10-9-GC Standoff bracket VIB3-18-GC	1156 2/1/79 1213 6/4/81	Same as above.
Anderson/Sq. D Standoff bracket, COB-E-180-TGL	1180 1/31/80	Same as above.
Dixie Deadend bracket assembly D21142 for 12.5/7.2 kV Deadend bracket assembly D21144 for 24.9/14.4 kV	1220 10/8/81	Same as above.
Universal Electric Single post insulator bracket, SAB-3-18-GC	1271 12/15/83	Same as above

fj - Bracket, extension

(For use in mounting oil circuit reclosers or sectionalizers)
See Drawing VM3-10A

	Through Bolt Type	Band Type
Aluma-Form	TBRSM-1, TB2M1-9*	RSM-1
Dixie	D-2359-M	
Joslyn	J2357M	
McGraw-Edison	DR2E3	

*For mounting double lug reclosers.

fk - Bracket, oil circuit recloser or sectionalizer

(For cluster mounting of three oil circuit reclosers on pole)

Aluma-Form	RSM-3, 6M3-9*
*McGraw-Edison	DT8C1
Turner	695-3

*Suitable for 14.4 and heavy duty 7.2 kV.

fl - Rack, primary metering

(For cluster mounting of primary metering equipment on pole)

Aluma-Form	PMM Series
Turner	3CT-PT

fm
January 1984

fm - Bracket, Arrester and Pothead Extension

For Distribution Arrester and Cutout - Pole Mounting

Manufacturer		Single Phase	Three Phase
Aluma-Form		1HCA-18 Series	R3CA-48
Anderson/ Square D	12.5/7.2 kV	COB-E-120-TGL	
	24.9/14.4 kV	COB-E-180-TGL	
Bethea/National	12.5/7.2 kV	VIB3-18-R1-GC-C	
	24.9/14.4 kV	VIB3-18-GC	
Chance		C653-1038	C653-1056
Continental	12.5/7.2 kV	IACB-12-5LGE	GPB-3-0-568M-3012-CAT 12
	24.9/14.4 kV	IACB-18-5LGE	GPB-3-0-568M-4017-CAT 12
Dixie	12.5/7.2 kV	D-1580	D27211-G
	24.9/14.4 kV	D-1583	
Flagg (MIF)	12.5/7.2 kV	PA613H	
	24.9/14.4 kV	PA619H	
Lapp	12.5/7.2 kV	304036-G	
	24.9/14.4 kV	304038-G	
McGraw-Edison		DC34B3	
Power Line Hardware	12.5/7.2 kV	CA-12-3GL	
Shakespeare		892-18	670-40
Universal Electric		SAB-3-18-GC	

For two distribution arresters in parallel or one arrester and cutout - crossarm mounted

Manufacturer	Catalog No.
McGraw-Edison	DM23B2

For Intermediate Arrester Mounting

Manufacturer		Single Phase	Three Phase
Aluma-Form		WBMA-1	R3CSA-48
Bethea/National	12.5/7.2 kV	VIB3-18-R1-GC-C	

fn - Bracket, Cutout Extension

Manufacturer		Catalog Number
Anderson Elec./ Square D	12.5/7.2 kV	COB-E-120-TGL
	24.9/14.4 kV	COB-E-180-TGL
Bethea/National	12.5/7.2 kV	VIB3-12F-GC
	24.9/14.4 kV	VIB3-18-GC
Chance		C653-1038
Continental	12.5/7.2 kV	IACB-12-5-LGE
	24.9/14.4 kV	IACB-18-5-LGE
Flagg (MIF)	12.5/7.2 kV	PA613H
	24.9/14.4 kV	PA619H
Lapp	12.5/7.2 kV	304036-G
	24.9/14.4 kV	304038-G
McGraw-Edison		DC34B1
Power Line Hardware	12.5/7.2 kV	CA-12-3GL
Shakespeare		892-18
Universal Electric		SAB-3-18-GC

fo - Bracket, Transformer Secondary, Insulated

Manufacturer	Bracket Without Insulator	Bracket With $2\frac{1}{4}$" Diameter Spool Insulator	Bracket With 3-1/8" Diameter Spool Insulator
Chance	-	9113S	9114S
Joslyn	-	J6765-A	J6765
McGraw-Edison	DT4M1	DT4M13	DT4M11
Utilities Service	865	865/208	865/205

ga - Watthour and Watthour-Demand Meters
Polyphase 2 element - 4 wire Delta - 120/240 volts

Self-Contained Types

Manufacturer 1	Type of Base 2	Watthout Meter Type 3	Mechanical Demand Watthour Type 4	Thermal Demand Watthour Type 5	Number of Terminals 6
Duncan	Bottom Con.	-	-	-	-
	Socket	MT-15S	BMT-15S	TMT-15S	7
General Electric	Bottom Con.	V66A	VM66A	-	7
	Socket	V66S	VM66S	-	-
Sangamo	Bottom Con.	S6A	S6DA	PWA Delta	-
	Socket	S6S	S6DS	PWS Delta	7 or 8
Westinghouse	Bottom Con.	D5A7	D5A7M	-	7 or 8
	Socket	D5S7	D5S7M	-	-

Transformer Rated Types

Duncan

General Electric

Not shown in REA Bulletin 161-12

Sangamo

Westinghouse

ga - Watthour and Watthour-Demand Meters
Polyphase - 2-1/2 element - 4 wire wye - (120/208) (277/480) volt

Self-Contained Types

Manufacturer 1	Type of Base 2	Watthout Meter Type 3	Mechanical Demand Watthour Type 4	Thermal Demand Watthour Type 5	Number of Terminals 6
Duncan	Bottom Con.	-	-	-	-
	Socket	MT-14S	BMT-14S	TMT-14S	7
General Electric	Bottom Con.	V65A	VM65A	-	7
	Socket	V65S	VM65S	-	-
Sangamo	Bottom Con.	S5A	S5DA	PWAY	-
	Socket	S5S	S5DS	PWSY	7 or 8
Westinghouse	Bottom Con.	D5A8	D5A8M	-	7
	Socket	D5S8	D5S8M	-	-

Transformer Rated Types

Duncan	Bottom Con.	MT-6A	BMT-6A	TMT-6A	10
	Socket	MT-7S or 6S	BMT-7S or 6S	TMT-7S or 6 S	7 or 13
General Electric	Bottom Con.	V65A	VM65A	-	7 or 13
	Socket	V65S	VM65A	-	-
Sangamo	Bottom Con.	S5A	S5DA	PWAY	-
	Socket	S5S	S5DS	PWSY	13
Westinghouse	Bottom Con.	D5A8	D5A8M	-	-
	Socket	D5S8	D5S8M	D4S8H	13

ga - Watthour and Watthour-Demand Meters

Manufacturer	Meeting No. and Date	Conditions
Sangamo		
Socket base, 3 wire 1ø watthour meter, Type J4ES, Class 320	1103 12/2/76	1. To obtain experience. 2. To be used only where Class 320 meters are permitted by local regulatory bodies. 3. To be used only with sockets rated for Class 320 service.

gb - Meter Sockets

Manufacturer	Type or Catalog Number: Ring	Type or Catalog Number: Ringless	No. Jaws	Rating, Amps.
Anchor #	1000 Series(1003-1006)	1000 Series(1003-1006)	4,5	100
	1100 Series(1100-1109)	1100 Series(1100-1109)	4,5,7	150
	1200 Series(1201-1209)	1200 Series(1201-1209)	4,5	200
		1200/1300 Series(1275-1300)	4,5,7	200
	1600 Series(1600-1661)	1600 Series(1600-1661)	4,5	320
	1500 Series(1500-1526)	1500 Series(1500-1526)	4,5	100/125 per sta.
	1500 Series(1530-1536)	1500 Series(1530-1536)	4,5	150 per sta.
	1500 Series(1540-1546)	1500 Series(1540-1546)	4,5	200 per sta.
	1400 Series(1405-1473)	1400 Series(1405-1473)	4,5,6,7,8,13	20/100
Crouse-Hinds (Arrow-Hart/ Murray)	SJ Series* (Single)	RJ Series* (Single)	4,5,6	100
	SD Series* (Mult.)	RD Series* (Mult.)	4,5,6	125 per sta.
	SN Series* (Single)	RN Series* (Single)	4,5,6	100
	SS Series* (Single)	RS Series* (Single)	4,5,6	200
		RH Series* (Single)	5,7	200 HD

#Available with UL label
*UL label

sb - Switch, disconnect (single-pole, hook-operated station class)

NEMA standard switches for station or line structure use where single-pole switching is permissible

Manufacturer	Type	Voltage Ratings	System Voltages Line to Line
Bridges	EH	15 thru 69 kV	12.5 thru 69 kV
	EHL(L)	15 thru 34.5 kV	12.5 thru 34.5 kV
Brown Boveri Elec. (ITE)	HPL	15 thru 69 kV	12.5 thru 69 kV
	DS(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
G & W Electric	B-2M	15 thru 69 kV	12.5 thru 69 kV
	EV(PL)	15 thru 34.5 kV	12.5 thru 34.5 kV
Hi-Voltage (Joslyn)	HU	15 thru 69 kV	12.5 thru 69 kV
	HI	15 thru 69 kV	12.5 thru 69 kV
Johnson	HPT	15 thru 69 kV	12.5 thru 69 kV
Kearney	M-72(PL)	15 thru 69 kV	12.5 thru 69 kV
	H-72	15 thru 34.5 kV	12.5 thru 34.5 kV
McGraw-Edison	D2(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
MEMCO	STV	15 thru 69 kV	12.5 thru 69 kV
	STU	15 thru 69 kV	12.5 thru 69 kV
Morgan	DHS (PL included in 15 kV)	15 thru 69 kV	12.5 thru 69 kV
ITT Royal Switchgear	BT	15 thru 69 kV	12.5 thru 69 kV
	BLT(PL)	15 and 23 kV	12.5 thru 24.9 kV
S & C	LBD(PL)	15 thru 34.5 kV	12.5 thru 34.5 kV
	Alduti(L)	15 and 25 kV	12.5 thru 24.9 kV
Seeco	BT	34.5 thru 69 kV	34.5 thru 69 kV
Siemens-Allis	HA	15 thru 69 kV	12.5 thru 69 kV
	HS(PL)	15 and 25 kV	12.5 thru 24.9 kV

(L) Means solid material load interrupters are available and accepted.

(LV) Means vacuum interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available.

sb - Switch, disconnect (single-pole, hook-operated station class)

NEMA standard switches for station or line structure use where single-pole switching is permissible

Manufacturer	Type	Voltage Ratings	System Voltages Line-to-Line
Southern States	PBO	15 thru 69 kV	12.5 thru 69 kV
	*PBN	15 thru 23 kV	12.5, 13.2, 24.9 kV
USCO	HH(PL)	15 thru 69 kV	12.5 thru 69 kV

(L) Means solid material load interrupters are available and accepted.

(LV) Means vacuum interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available.

* With steel base only.

sb - Switch, disconnect (single-pole, hook-operated distribution class)*

For distribution line use where power class insulation is not required and single-phase switching is permissible.

(Not suitable for substation use)

Manufacturer	Type	Voltage Rating	System Voltage Line-to-Line
Brown Boveri Elec. (ITE)	DS(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
Chance	M3(PL)	15 and 27 kV	12.5 thru 24.9 kV
G & W Electric Company	EV(PL)	15 kV	12.5 kV
Kearney	D-73(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
McGraw-Edison	D2(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
Morgan	DHS (PL included in 15 kV)	15 and 23 kV	12.5, 13.2, 24.9 kV
ITT Royal	BLT(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
S & C	LBD(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
Siemens-Allis	HD(PL)	15 and 25 kV	12.5 thru 24.9 kV

NOTE: Switches on this page must be furnished with four bolts for double crossarm mounting.

(L) Means solid material load interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available.

(LV) Means vacuum interrupters are available and accepted.

*Steel bases only.

sc - Regulators, Voltage
12.5/7.2 kV
13.2/7.62 kV

Applicable Specification: REA "Specification for Substation Regulators," S-2

Type	Size	Description
	General Electric	
VR-1	38.1 - 509 kVA	(SL) Single phase - step type
MLT	500 - 1000 kVA	(S) Three phase - step type
VML-32	500 - 833 kVA	(S) Single phase - vacuum step type
VMLT-32	1200 - 2800 kVA	(S) Three phase - vacuum step type
	McGraw-Edison	
VR-32	19.1 - 500 kVA	(SL) Single phase - step type
AB	50 amp.	(L) Single phase - step type (Auto-Booster)
	Siemens-Allis	
JFR	38.1 - 667 kVA	(SL) Single phase - step type
	Westinghouse	
UTS, UTT	167 - 1000 kVA	(S) Three phase - step type

(L) Indicates line use
(S) Indicates substation use

sk - Switch, regulator by-pass - disconnect
For outdoor use

Manufacturer	Meeting No. and Date	Conditions
McGraw-Edison Type B, 15 kV, 400 amperes 110 kV BIL for station use 95 kV BIL for line use	1035 2/21/74	To obtain experience.

NOTE: All switches should be furnished with NEMA standard insulators and with 110 kV BIL rating for station use.

s1 - Switch, Combination Power Fuse and Disconnect

(Used with an additional disconnect switch to by-pass oil circuit reclosers at substations.)

Manufacturer	15 kV for use on 7.2/12.5 systems	27 kV for use on 14.4/24.9 systems
Hi Voltage	RFH	
Kearney	MHX	MHX
McGraw-Edison	FC2	
S & C Electric	SMD/LBD XS/LBD	SMD/LBD
ITT Royal Switchgear	TUF	
Southern States	SF	

NOTE: All switches and cutouts should be furnished with NEMA standard insulators.

zz - Poles

Applicable preservatives: Creosote, pentachlorophenol-petroleum and waterborne salts (ACA and CCA)

(Firms listed on pages zz-1 through zz-7 are also qualified to treat crossarms. Crossarms should be fabricated at one of the plants listed on page g-1 or g-2.)

Pressure Treatment

	Insured Warranted	Independently Inspected
Alabama Wood Treating Corp.	-	Mobile, Ala.
American Creosote Works, Inc.	-	Jackson, Tenn. Louisville, Miss. Pensacola, Fla.
American Crossarm & Conduit Co.	-	Chehalis, Wash.
American Wood		Richton, Miss.
Arkwood	-	Omaha, Arkansas
Atlantic Wood Industries, Inc.	-	Portsmouth, Va. Savannah, Ga. Vidalia, Ga. Fruitland, Md.
Baldwin Pole & Piling Co.	-	Bay Minette, Ala.
J. H. Baxter & Co.	Eugene, Ore.	Eugene, Ore. Long Beach, Calif. The Dalles, Ore. Arlington, Wash, Weed, Calif. Laramie, Wyo.
Benton Creosoting Co. (Kennedy Saw Mills)	-	Benton, La.
Broderick Wood Products Co.	-	Denver, Colo.
Brown Wood Preserving Co.	-	Brownville, Ala. Louisville, Ky.
Burke-Parsons-Bowlby Corp.	-	Leland, N. C.
Carolina Creosoting Corporation	-	Leland, N.C.
Cascade Pole Co.	- -	Tacoma, Wash. Olympia, Wash.

zz - Poles

Pressure Treatment

	Insured Warranted	Independently Inspected
Cowboy Timber Treating, Inc.	-	Manderson, Wyo.
Colfax Creosoting Co.	-	Pineville, La.
Conroe Creosoting Co.	-	Conroe, Texas
Crown Zellerbach Corp.	-	Gulfport, Miss. Mobile, Ala. Urania, La. Sallisaw, Okla.
Dant & Russell, Inc.	-	North Plains, Ore.
Davis Timber Company, Inc.		Hattiesburg, Miss.
Durable Wood Preservers, Inc.	-	Charlotte, N.C.
Eppinger and Russell	-	Chesapeake, Va.
Escambia Treating Co.	-	Brunswick, Ga. Pensacola, Fla. Camilla, Ga. Brookhaven, Miss.
Fernwood Industries	-	Fernwood, Miss.
Fordyce Wood Treaters, Inc.		Fordyce, Ark.
Garland Creosoting Company	-	Longview, Texas
Hart Creosoting Company	-	Jasper, Texas
Hoosier Treating Company	-	Gosport, Ind.
Huxford Pole & Timber Co., Inc.	-	Huxford, Ala.

zz - Poles

Pressure Treatment

	Insured Warranted	Independently Inspected
Idaho Pole Company	-	Bozeman, Mont.
International Paper Co. Wood Preserving Division	-	De Ridder, La. Joplin, Mo. Navasota, Texas
	Wiggins, Miss.	*Wiggins, Miss.
Jasper Creosoting Co.	-	Jasper, Texas
Kerr-McGee Chemical Corp. Forest Products Division		Meridian, Miss. Columbus, Miss. Texarkana, Texas
Koppers Co., Inc.	-	Carbondale, Ill. *Denver, Colo. Florence, S.C. Gainesville, Fla. Grenada, Miss. Houston, Texas *Montgomery, Ala. N. Little Rock, Ark. *Oroville, Cal. Salisbury, Md. Richmond, Va. Galesburg, Ill. Nashua, N.H.
Lake States Wood Preserving, Inc.	Munising, Mich.	Munising, Mich.

*Cellon process also accepted.

zz - Poles

Pressure Treatment

	Insured Warranted	Independently Inspected
Langdale Company	Sweetwater, Tenn. Valdosta, Ga.	Sweetwater, Tenn. Valdosta, Ga.
Lockhart Lumber Company	-	Lockhart, Ala.
Lufkin Creosoting Co.	-	Lufkin, Texas
MacGillis & Gibbs	-	Madera, Cal.
McCormick & Baxter Creosoting Co.	-	*Portland, Ore. *Stockton, Cal.
L. D. McFarland Co.	Eugene, Ore.	Eugene, Ore.
Marion Pressure Treating Co.	-	Marion, La.
William C. Meredith Co.	-	Atlanta, Ga.
T. R. Miller Mill Co., Inc.	-	Brewton, Ala.
Madisonville Creosote Works	-	Madisonville, La.
Montana Pole & Treating Plant	-	Butte, Mont.
Niedermeyer-Martin Co. (Pacific Wood Treating Corp.)	-	Ridgefield, Wash.
Oeser Cedar Company	-	Bellingham, Wash.

* Cellon process also accepted.

zz - Poles

Thermal (Non-Pressure) Treatment

	Insured Warranted	Independently Inspected
J. H. Baxter & Co.	-	Arlington, Wash.
Bell Lumber & Pole Co.	-	Minneapolis, Minn.
B. J. Carney Industries		Sandpoint, Idaho
Cascade Pole Co.	-	Tacoma, Wash.
Cedar Service, Inc. (R. G. Haley and Co., Inc.)	-	Bemidji, Minn.
Idaho Pole Company	-	Bozeman, Mont.
Kalispell Pole & Timber Co.	-	Kalispell, Mont.
MacGillis and Gibbs Co.	-	Minneapolis, Minn.
L. D. McFarland Co.	Eugene, Ore. Sandpoint, Idaho	Eugene, Ore. Sandpoint, Idaho
Oeser Cedar Co.	-	Bellingham, Wash.
Page & Hill Forest Products	-	Big Falls, Minn.
Poles Incorporated	-	Newport, Wash.

U an - Transformers, Distribution, Direct Burial*

(5-25 kVA only)

Conditions: To obtain experience.

Manufacturer	Metallic Tank (Cathodic protection required)	Nonmetallic Tank (Cathodic protection not used)
Central Moloney (Meeting 993, 6/8/72	"Trenchmite" 15-25 kVA Radial Feed or Loop Feed (same end) only	
Sargent-Tyee (Meeting 1016, 5/10/73)		"No-Korrod" 10-25 kVA

*Direct burial transformers are at an early stage in their development. Large numbers of direct burial transformers should not be purchased from any one manufacturer by any one borrower in any one year. Carefull location records should be kept.

U ax - Cutout and Arrester

Combination for Underground System Pole Risers

Nominal System Voltage	For 12.5Y/7.2 kV		For 13.2Y/7.6 kV	For 24.9Y/14.4 kV	Conditions
Cutout Maximum Voltage Rating	7.8 kV	15 kV	15 kV	27 kV	
Application	1Ø Risers	3Ø Risers	1Ø and 3Ø Risers	1Ø and 3Ø Risers	
Cutout Current Rating	100 amps	100 amps	100 amps	100 amps	

Metal Oxide Type Arresters

Manufacturer	Catalog Numbers				
Joslyn (Distribution) Meeting No. 1266(9/22/83)	J9237-ZJ2	J9237-ZJ2/R	J9237-ZJ2/R	J9267-ZJ2	To obtain experience.

Note 1: Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with REA Bulletin 61-3, "Underground Rural Distribution."

Note 2: Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

U cg - Switch, air, three-pole, group-operated for pole-mounted cable risers (Factory Preassembled)

Manufacturer	Mounting	Vertical Break Type kV	Side Break Type kV
Chance	Vertical		D7(L)15-27
	Horizontal		D7(L)15-27
S & C	Vertical		Alduti(L)15-25
	Horizontal		Alduti(L)15-25
Westinghouse	Vertical	LB3-VR(L)15	

(L) Means gas or solid material full-load interrupters are accepted and available.

NOTE: Switches with factory-assembled crossarm type bases must have nonconducting crossarm type bases, nonconducting braces, and insulated interphase and control rods.

U fw
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U fw - Secondary Tap Connector

Manufacturer	Type or Catalog No.
Raychem	Compression Connectors CTE-300-00 CTE-400-00 CTE-500-00 Standard Split Bolt CTE-300-00 CTE-400-00

U gc - Shield, cable riser

Manufacturer	Dia. (Inches)	Length (Feet)
	Galvanized Steel	
Chance	2 - 3 - 3	5 - 9
*Electrical Materials	2 - 3 - 4 - 5	5
*#Fargo	2 - 3 - 3-3/4 - 5	5 - 8 - 10
*Joslyn	2 - 3 - 3	5 - 8
*McGraw-Edison	2 - 3 - 4	3 - 5 - 10
Midland-Ross (Kindorf Snapduct)	2 - 3 - 5 (14 ga. galv. steel)	2 - 5 - 10
#Utility Products Co.	3/4 - 1 - 2 - 3 - 3-3/4	3 - 5 - 8
	Plastic and Fiberglass	
*Electrical Materials (plastic)	2 - 3 - 4 - 5	5 - 10
*Hercules (Haskon) (plastic) (Power Mold I, II, III)	2 - 3 - 4 - 5	5 - 9 - 10
*Joslyn (plastic)	2 - 3 - 4 - 5	5 - 10
*Nordic (fiberglass)	2 - 3 - 5	5 - 10
*Quazite Corp. (Composolite - plastic)	2 - 3 - 4 - 5	10

(Order by size and length)

#All sizes available with galvanized finish or painted-over galvanizing.

*All sizes available with back plate.

U gk - Terminations, Indoor

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Voltage Class	Catalog No.
Joslyn	15 kV	J9275

U gp - Connector Blocks and Splices, Secondary

Watertight - For Use In All Locations

Manufacturer	Connection Type	Catalog Number
Alcoa	Lug	Interchange-I ABB Series Use with A-9 insulating boots
Alcon	Set Screw	VPB Series
AMP	Compression	600 Volts secondary UG Distribution 4-way and 6-way bus system
Blackburn	Lug Set Screw	Series UP (with lugs and sleeves) Series UB (1000 amp bus with sleeves)
Burndy	Lug	URD Mole
Electrical Spec. Prod.	Lug Set Screw	Type UC (8 AWG - 500 kcmil) (with LA lug and sleeve) Type UB (with sleeve) Splice Type ACL-HSH (6 AWG - 500 kcmil)
Fargo	Set Screw	GU-500 Series
Homac	Lug Lug Set Screw	FS-95 Series with flood seal sleeve kit (8 AWG - 350 kcmil) FS-125 Series with flood seal sleeve kit (350 - 500 kcmil) SHC Series
Kearney	Compression Compression	HCR HAR
Penn Union	Lug	DBA Series with DBTB, DBTBF and DBTH Series lug and sleeve kits
Reliable	Set Screw	15903-15908, 15910 with sleeve kit (4 AWG - 350 kcmil) 15911 with sleeve kit (500 - 750 kcmil)
RTE	Compression	Aqua Guard Splice Kit
Utilco	Set Screw	Safety Sub Splice - USPA-350SS

U gp - Connector Blocks and Splices, Secondary

Non-Watertight - For Use In Above-Grade Pedestals Only

Manufacturer	Connection Type	Catalog Number
ITT Blackburn	Set Screw	Type PSB-C
Electrical Spec. Prod.	Set Screw	UP-B Series
Fargo	Set Screw	GUS-200 Series
Homac	Set Screw	CLR-350 Series
Utilco	Set Screw	PED-350-IN Series

U gq - Boot or sleeve, insulated*

Manufacturer	Catalog Number
ITT Blackburn	MPC9 MPC15
Electrical Materials	100-B (for pad-mounted transformer spade terminals)

*Use restricted to 120/208 volt 500 kVA transformers and larger not equipped with threaded studs.

U hv - Cable, Underground

600 Volt Multi-Conductor Cable

Applicable Specification: REA Specification U-2
Conductor : Copper, #4 AWG and larger
Aluminum, #2 AWG and larger
Insulation : Cross-linked polyethylene (XLPE)
Cable Configuration : 3 Insulated Conductors Triplexed

Manufacturer	Type Conductor
Alcan	Copper or Aluminum
Alcoa	Aluminum
Anaconda Ericsson	Copper or Aluminum
Essex	Copper or Aluminum
General Electric	Copper or Aluminum
Hatfield	Copper
Kaiser	Aluminum
Okonite	Copper or Aluminum
Phillips Cables, Inc. (Marked "Phillips W")	Copper or Aluminum
Pirelli	Copper or Aluminum
Reynolds	Copper or Aluminum
Rome Cable	Copper or Aluminum
Southwire	Copper or Aluminum
Triangle	Copper or Aluminum

NOTE: The above cable may be supplied with UL label for Type USE.

Conditional List
U hv(1)
January 1984

U hv - Cable, Underground
(15 or 25 kV cable)

TREE RETARDANT

Manufacturer	Meeting No. and Date	Conditions
Alcoa		
DFDA 6202 HMW	1148(9/28/78) 1198(10/23/80)	To obtain experience
Essex		
DFDA-6202 HMW	1236(6/10/82)	To obtain experience
Hendrix		
DFDA 6202 HMW	1151(11/16/78) 1198(10/23/80)	To obtain experience
Pirelli		
DFDA-6202 HMW	1152(12/7/78) 1202(12/18/80)	To obtain experience
Reynolds		
Reynotree-U (DFDA-6202 HMW)	1151(11/16/78) 1196(9/18/80) 1255(3/24/83)	To obtain experience
HEFD-4202 (XL)	1258(5/5/83)	
Rome Cable		
UCAR TR-7521 LLDHMW	1271(12/15/83)	To obtain experience

U ja - Transformer Pad

Manufacturer	Meeting No. and Date	Conditions
Associated Plastics		
API 4000 Series RPM	1191 7/24/80 1194 9/4/80	To obtain experience.
Carolina Dielectrics		
Model 0502-1 Fiberglass Size: 40" x 44"	1000 9/14/72	To obtain experience.
Chance		
C107-0162 and C107-0171 Fiberglass Size: 40" x 44"	994 6/29/72	To obtain experience.
Cyclo		
Dwg. No. 730126-2 Molded polyethylene Size: 42" x 42"	1147 9/14/78	To obtain experience.
Heil Rotomold, Inc.		
T Series* High density polyethylene	1228 2/4/82	To obtain experience.
Highline		
HL-46B, Fiberglass Size: approx. 42" x 42"	989 4/13/72	To obtain experience
Plastic Structures		
No. 40402012 Molded polyethylene Size: 40" x 40"	997 7/27/72	To obtain experience.
Quazite Corp.		
Composolite - PH Series	1141 6/15/78 1267 10/13/83	To obtain experience.
Thermodynamics		
Poly-Pad, PR Series* Molded polyethylene	998 8/17/72 1009 2/1/73	To obtain experience.

*Order by catalog number and size.

Conditional List
U ja(1.1)
July 1983

U ja - Transformer Pad

Manufacturer	Meeting No. and Date	Conditions
Power Line Hardware T-4242 Molded polyethylene Size: 42" x 42"	1158 3/1/79	To obtain experience.
Formex Model TP-REA Molded polyethylene	1159 3/15/79	To obtain experience.
Major Frame-Crete ETPP precast cellular concrete 42" x 42"	1166 6/21/79	To obtain experience.
Smith Cattleguard Easi Set T. Series Precast Reinforced Concrete	1187 5/22/80	To obtain experience
Nordic TP series Fiberglass	1255 3/24/83	To obtain experience.